SAHS Commentary

South African Hypertension Society commentary on the American College of Cardiology/American Heart Association hypertension guidelines

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Abstract

In late 2017, the publication of the new American College of Cardiology (ACC)/American Heart Association (AHA) hypertension guidelines created considerable controversy. The threshold for hypertension was redefined as > 130/80 mmHg and target blood pressure < 130/80 mmHg. The purpose of this commentary is to give clarity on the position of the Southern African Hypertension Society (SAHS).

In South Africa more than 90% of hypertensives are not controlled at < 140/90 mmHg. Furthermore, by redefining hypertension to a level of 130/80 mmHg, this will significantly increase the prevalence of hypertension by 43%. The new targets will necessitate greater use of health services for increased health visits to monitor patients, greater use of antihypertensives to achieve the lower target, and increased use of laboratory services to monitor for adverse effects.

It is the position of SAHS that the new definition and targets are not relevant to low- and middle-income countries such as South Africa, the threshold for hypertension remains at 140/90 mmHg, and a universal target is < 140/90 mmHg for all categories of hypertension.

Keywords: BP definitions, BP targets, commentary, South African Hypertension Society

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Prior to 2009, there was general unanimity on blood pressure (BP) targets in all major guidelines. For uncomplicated essential hypertension it was < 140/90 mmHg and for high-risk patients, diabetics and those with established cardiovascular (CV) disease it was < 130/80 mmHg.[1]

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However, in 2009, in a reappraisal of the European Society of Hypertension guidelines, the authors found no evidence to suggest the lower target for high-risk patients.[2] For example, in patients with diabetes, no study that randomised patients to conventional versus intensive targets showed benefit in lowering BP to < 130/80 mmHg. There were also several observational studies to suggest that there was a U-shaped relationship between BP and outcome, with patients with both low and high systolic and diastolic BP having worse CV outcomes.[3,4] Low diastolic BP was of special concern as myocardial perfusion occurs during diastole and this could be potentially compromised, especially in those with coronary artery disease and left ventricular hypertrophy. The major drawback of observational studies is that they suffer from bias, unaccounted confounding factors and reverse causality, i.e. low BP was a manifestation of underlying cardiac disease.

In view of these concerns, major guidelines in 2013 and 2014 revised BP targets and abandoned the lower target for patients with diabetes and high CV risk.[5-7] All major guidelines then recommended a unitary target of < 140/90 mmHg for all hypertensives, apart from the elderly, where this was increased to < 150/90 mmHg in the elderly in two of these publications.[5,7]

However, in late 2017, the publication of the new ACC/AHA hypertension guidelines created considerable controversy.[8] The purpose of this commentary is to give clarity on the position of the Southern African Hypertension Society (SAHS).

Summary of the AHA/ACC hypertension guidelines

The AHA/ACC hypertension guideline was a major overview for the prevention, detection, evaluation and management of high BP in adults, and the reader is referred to this publication for full details.[8] This was the most controversial guideline developed in the United States. However, many of the recommendations were non-controversial. For example, emphasis was placed on the appropriate technique of BP measurement, the increased need for out-of-office BP measurement, and treatment of hypertension after acute stroke and hypertensive emergencies. The value of risk assessment was recognised and introduced for the first time.

However, central to the controversy was the redefining of hypertension and, arising from this, a change in target BP (Tables 1, 2). Hypertension was defined as a BP ≥ 130 systolic and/or diastolic ≥ 80 mmHg on at least two occasions, and the target BP

Table 1. Classification of hypertension according to the AHA/ACC hypertension guidelines (adapted reference 8)

*BP category**	*SBP*		*DBP*
Normal	< 120	and	< 80
Elevated	120–129	and	< 80
Hypertension			
Stage 1	130–139	or	80–89
Stage 2	≥ 140	or	≥ 90

*Individuals with SBP and DBP in two categories should be designated to higher BP based on two or more careful readings obtained on two or more occasions.

< 130/80 mmHg. The current SAHS definition of hypertension is shown in Table 3 for comparison.

What was the rationale for the changes?

It is reasonable to assume that the recommendations were based largely on the SPRINT study.[9] In brief, the SPRINT study enrolled hypertensive patients over 50 years, with a systolic BP between 130 and 180 mmHg, with clinical or subclinical CV disease without diabetes or stroke, but including those with chronic kidney disease. Patients were randomised to intense control of systolic BP (< 120 mmHg) versus usual control (< 140 mmHg). The study was stopped prematurely because in the intensive arm there was significant reduction in major adverse CV events (MACE) [hazard ratio (HR) 0.75 (0.64–0.89), $p < 0.001$], CV mortality [HR 0.57 (0.38–0.85), $p = 0.005$] and heart failure [HR 0.62 (0.45–0.84), $p = 0.002$].

As a result of the study, the new Canadian hypertension guidelines recommended a target of < 120/80 mmHg in those patients meeting the SPRINT entry criteria.[10] However the AHA/ACC recommended a target BP of < 130/80 mmHg for all hypertensives.[8] The slightly higher target was presumably recommended as analysis of the results of SPRINT showed that in weighing risks versus benefits, the best results were achieved at a systolic BP of < 132 mmHg.[9]

What are the controversies?

Several controversies arose from these recommendations, but central to this was the redefinition of hypertension and the resultant changes in target. Although there is a clear relationship between increasing BP and CV events, starting at 115/75 mmHg,[11] the definition of hypertension has been generally defined as > 140/90 mmHg, based on a pragmatic definition where diagnosis and treatment do more good than harm, as proposed by Rose.[12] The European hypertension guidelines of 2018 have not changed the definition of hypertension,[10] and it is difficult to understand how two authoritative guideline committees come to different recommendations based on the same evidence.[13]

There is currently no evidence to support treating patients with systolic BP levels between 130 and 140 mmHg, without additional markers of CV risk, to a target BP < 130/80 mmHg.

Table 3. Current SAHS definition of hypertension (adapted reference 1)

*BP category**	*SBP*		*DBP*
Normal	< 120	and	< 80
Optimal	120–129	and	< 80
High normal	130–139	or	80–89
Hypertension			
Grade 1	140–159	or	90–99
Grade 2	160–179	or	100–109
Grade 3	≥ 180	or	≥ 110
Isolated systolic	≥ 140	and	< 90

*Individuals with SBP and DBP in two categories should be designated to higher BP based on two or more careful readings obtained on two or more occasions.

This is highlighted in the ACC/AHA guidelines where there was only a recommendation to treat low-risk hypertensives pharmacologically at systolic BP levels between 130 and 140 mmHg.[8]

The evidence from other studies involving high-risk patients with previous stroke and diabetes (excluded from SPRINT) was also not conclusive in finding benefit from intensive BP control. In the ACCORD study, which was a similar study to SPRINT and performed in high-risk patients with type 2 diabetes, intensive control of systolic BP (< 120 vs < 140 mmHg) did not result in a significant reduction in MACE.[14] Therefore, in contrast to the ACC/AHA guidelines, the American Diabetes Association recommendation for the definition of hypertension for diabetics remains unchanged at 140/90 mmHg, and most patients with diabetes and hypertension should be treated to a systolic BP goal of < 140 mmHg and a diastolic BP goal of < 90 mmHg. Lower systolic and diastolic blood pressure targets, such as 130/80 mmHg, may be appropriate for individuals at high risk of CV disease, if they can be achieved without undue treatment burden.[15] Similarly, in the SPS3 study done in patients with hypertensive stroke, intensive BP control did not meet the primary end-point of reduction in stroke events, although there was a significant reduction in incidence of haemorrhagic stroke.[16]

Another controversy arising from SPRINT was the way the BP was measured. This was done by automated devices and a mean of three readings were taken that were generally unobserved. This method of BP measurement is termed automated office blood pressure (AOBP). It more accurately reflects daytime ambulatory BP by reducing the white-coat effect and correlates better with target-organ damage than conventional office BP.[17] Office systolic BP in the standard clinical setting is on average 15 mmHg higher than AOBP, presumably due to reduction in white-coat effect and inaccuracies in standard office measurements.[18] Although the improvement in accuracy of BP measurement in clinical trials and practice is desirable, the lack of standardisation of measurement between trials complicates the recommendations ont targets and definitions of hypertension.

Important adverse events were reported in SPRINT and ACCORD in the intensive group, mostly attributed to too-low

Table 2. BP targets according to the AHA/ACC hypertension guidelines (adapted reference 8)

Level of recommendation	*BP goal for patients with hypertension*
I	For adults with confirmed hypertension and known CVD or ASCVD event risk > 10%, a BP target < 130/80 mmHg is recommended
IIb	For adults with confirmed hypertension without additional markers of increased CVD risk, a BP target < 130/80 mmHg may be reasonable

CVD, cardiovascular disease; ASCVD, atherosclerotic cardiovascular disease.

BP and off-target side effects of antihypertensive treatment. These were dizziness, falls, syncope, electrolyte abnormalities, bradycardia (ACCORD only) and acute kidney injury. However, there were no injurious falls and no excess of patients requiring acute or chronic dialysis for end-stage chronic kidney disease in the intensively treated group.

Are the AHA/ACC high blood pressure guidelines fit for global purpose?

In a major commentary written in *Hypertension*, Poulter *et al.*, on behalf of the International Society of Hypertension, questioned the relevance of these guidelines from a global perspective, especially in low- and middle-income countries.[19] This is particularly pertinent to South Africa, and SAHS is in broad agreement with this document.

In South Africa, more than 90% of hypertensives are not controlled because of lack of awareness, failure to access treatment due to failure to screen, screened but not diagnosed, diagnosed but untreated and treated but not controlled.[20] By redefining hypertension to a level of 130/80 mmHg, this will significantly increase the prevalence of hypertension. In the USA it is estimated that the number of hypertensives will increase by 43% or 31.1 million people.[21] The prevalence of hypertension in South Africa is 35.1% and this means it is likely to rise to 50.2% (presuming a similar increase as reported in the USA) if the new definition is applied.

Similarly, the new targets will necessitate greater use of health services for increased health visits to monitor patients, greater use of antihypertensives to achieve the lower target, and increased use of laboratory services to monitor for adverse effects. In both the ACCORD and SPRINT trials, there was increased incidence of acute kidney injury and electrolyte abnormalities that will require extra monitoring.

As most hypertensives in the public sector are managed by nurse practitioners with the assistance of medical practitioners, there would be, by necessity, a major retraining of all health workers. The net result will be increased demands on health services that are already overburdened by demand and under-resourced in terms of health worker and financial constraints. This is in the setting of conflicting evidence for long-term clinical benefit, especially in low-risk groups.

Conclusion

The AHA/ACC hypertension guideline is a major departure from previous definitions of hypertension and target BP. Although a target BP < 130/80 mmHg may be acceptable in certain high-risk patients, the SAHS does not recommend the adoption of the new definitions and targets in South Africa.

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